ABSTRACT OF THE DISCLOSURE

An extensible fluid permeable substrate having at least one direction of extensibility in an X-Y plane is provided with improved retraction to make the composite material suitable for disposable garment applications with minimal application of coalesced elastomeric materials. A pattern of untensioned coalesced elastomeric stripes is applied on an X-Y plane surface of the substrate in low add-on amounts of between about 20% to about 100% of the substrate basis weight to make the composite material. The longitudinal axes of the coalesced elastomeric stripes are oriented substantially along the direction of substrate extensibility and desired retraction of the composite material. By applying the minimal amount of elastomer necessary in an open pattern, the economical composite material also avoids negative by-products of elastic coatings or films such as bad hand, bad drape, loss of fluid transfer or intake ability and lack of breathability. In a particular embodiment the coalesced elastomers are applied as electrospun microfibers yielding a very low add-on rate with fluid permeable coalesced elastomer areas while providing improved retractive properties to the substrate.

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	Sperm No.	Kraton add-on wt%	Load @ 30 Up Cyc 1 g	Load @ 50 Up Cyc 1 g	Load @ 30 Dn Cyc 1 g	Load @ 50 Dn Cyc 1 g	TEA (Ext) Cyc 1 kg*mm	TEA (Rel) Cyc 1 kg*mm	% Hyster Loss Cyc 1 %	Load @ 30 Up Cyc 2 g	Load @ 50 Up Cyc 2 g	Load @ 30 Dn Cyc 2 g	Load @ 50 Dn Cyc 2 g	TEA (Ext) Cyc 2 kg*mm	TEA (Rel) Cyc 2 kg*mm	% Hyster Loss Cyc 2 %	Irrmed Set % Cyc 1 %	Irrmed Set % Cyc2 %	Load Loss at 50% g
Control	1	0.0%	335	831	-18	678	0.194	0.033	82.8	33	767	-22	655	0.086	0.032	63.3	35.387	36.7	210.974
	2	0.0%	473	964	-15	787	0.254	0.042	83.6	58	888	-21	759	0.11	0.042	61.6	34.199	35.538	212.451
	3	0.0%	409	934	-17	763	0.227	0.041	81.8	42	862	-22	738	0.103	0.04	61.2	34.692	36.025	210.054
	4	0.0%	373	861	-18	697	0.208	0.035	83.2	34	789	-23	673	0.091	0.034	62.8	35.341	36.599	218.703
1SP	1	35.0%	480	933	-3	760	0.26	0.049	81.1	73	848	-10	726	0.112	0.045	59.6	32.512	34.27	222.332
	2	35.0%	539	1049	-3	851	0.292	0.055	81.2	78	950	-10	809	0.125	0.051	58.8	32.37	34.144	228.89
	3	35.0%	601	1154	0	939	0.323	0.06	81.3	88	1051	-9	899	0.14	0.059	58	31.867	33.689	220.98
2SP	1	65.0%	516	1008	3	832	0.279	0.059	78.9	95	916	-7	787	0.128	0.054	58.2	31.151	33.206	219.291
	2	65.0%	618	1068	6	889	0.323	0.063	80.5	116	980	-5	842	0.142	0.06	57.9	30.488	32.668	211.628
	3	65.0%	670	1198	9	987	0.353	0.072	79.6	123	1092	-4	941	0.158	0.068	57	30.132	32.298	214.511
3SP	1	40.0%	629	1138	5	941	0.332	0.069	79.3	107	1041	-6	899	0.147	0.064	56.7	30.714	32.775	210.6
	2	40.0%	550	1069	-2	878	0.293	0.057	80.5	77	977	-10	833	0.13	0.055	57.8	32.119	33.98	220.908
	3	40.0%	520	953	0	790	0.272	0.052	80.9	83	873	-9	750	0.119	0.05	58.3	31.793	33.639	212.73
4SP	1	100.0%	687	1142	19	930	0.366	0.069	81.2	148	1016	4	875	0.155	0.064	58.4	28.52	31.069	233.821
	2	100.0%	708	1192	18	983	0.373	0.072	80.8	150	1071	2	922	0.164	0.07	57.3	28.817	31.26	226.97
	3	100.0%	731	1184	23	976	0.385	0.073	80.9	168	1062	6	906	0.168	0.07	58.1	28.065	30.633	234.636
5SP	1	60.0%	619	1133	9	926	0.329	0.065	80.4	115	1031	-2	890	0.146	0.063	57.2	30.133	32.303	215.08
	2	60.0%	676	1154	11	950	0.362	0.068	80.7	130	1062	-2	897	0.154	0.065	57.9	29.761	32.053	222.192
	3	60.0%	758	1339	13	1094	0.398	0.078	80.4	140	1219	-1	1052	0.177	0.077	56.6	29.602	31.805	213.999

Table 1

	Sperm No.	Kraton addition w/%	Load @ 30 Up Cyc 1 g	Load @ 50 Up Cyc 1 g	Load @ 30 Dn Cyc 1 g	Load @ 50 Dn Cyc 1 g	TEA (Ext) Cyc 1 kg*mm	TEA (Ret) Cyc 1 kg*mm	% Hyster Loss Cyc 1 %	Load @ 30 Up Cyc 2 g	Load @ 50 Up Cyc 2 g	Load @ 30 Dn Cyc 2 g	Load @ 50 Dn Cyc 2 g	TEA (Ext) Cyc 2 kg*mm	TEA (Ret) Cyc 2 kg*mm	% Hyster Loss Cyc 2 %	Immed Set % Cyc 1 %	Immed Set % Cyc2 %	Load Loss at 50% g
9ES	1	10.0%	262	854	-7	694	0.183	0.039	78.5	40	782	-11	667	0.09	0.037	59.2	34.324	35.629	218.854
	2	10.0%	581	1077	-8	883	0.301	0.052	82.6	86	992	-16	844	0.132	0.053	60	32.762	34.328	216.312
	3	10.0%	614	1161	-6	966	0.319	0.06	81.3	90	1068	-13	919	0.143	0.059	58.6	32.315	33.914	207.838
7ES	1	5.0%	162	664	-10	536	0.129	0.027	79.2	25	611	-14	514	0.066	0.025	62	36.958	37.13	226.497
	2	5.0%	396	861	-6	707	0.22	0.044	80.1	59	797	-10	680	0.102	0.042	59.3	33.075	34.616	211.206
	3	5.0%	498	934	-3	767	0.262	0.05	80.8	76	859	-9	738	0.116	0.048	58.5	32.447	33.989	210.292
8ES	1	2.5%	611	1107	-4	920	0.317	0.059	81.4	88	1025	-12	879	0.138	0.058	57.8	32.348	33.898	205.988
	2	2.5%	549	1057	0	867	0.29	0.056	80.6	86	971	-6	827	0.132	0.055	58.1	31.77	33.37	217.485
	3	2.5%	447	960	-6	787	0.248	0.05	79.7	61	886	-12	761	0.112	0.046	58.9	33.194	34.722	207.293
9ES	1	7.5%	531	1037	-3	846	0.285	0.055	80.7	76	956	-8	814	0.126	0.053	58.2	32.363	33.964	214.699
	2	7.5%	601	1113	2	919	0.311	0.062	80	101	1027	-6	885	0.144	0.062	57.1	31.253	33.019	204.361
	3	7.5%	444	903	-7	742	0.239	0.043	82	61	836	-12	712	0.107	0.043	59.4	33.349	34.768	211.468
10ES	1	9.0%	512	954	-1	777	0.27	0.051	80.9	83	873	-8	744	0.118	0.049	58.9	31.996	33.648	219.88
	2	9.0%	493	1084	-4	890	0.278	0.059	78.9	70	1004	-9	852	0.131	0.056	57.2	32.586	34.158	214.45
	3	9.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2

Mechanical Properties of Screen Printed Materials

	Elastomer add-on wt%	% Hyster Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc2 %	% Reduction vs Control %	Modulus of Elasticity psi	% Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Sample1sp	35%	81%	2%	32%	10%	34%	6%	51	140 %
Sample3sp	40%	80%	3%	32%	11%	33%	7%	-	-
Sample5sp	60%	81%	3%	30%	16%	32%	11%	64	200 %
Sample2sp	65%	80%	4%	31%	14%	33%	9%	70	230 %
Sample4sp	100%	81%	2%	28%	20%	31%	14%	121	470 %

Table 3

Mechanical Properties of E-Spin Materials

	Elastomer add-on wt%	% Hyster Loss Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc 1 %	% Reduction vs Control %	Immed Set % Cyc2 %	% Reduction vs Control %	Modulus of Elasticity psi	% Improve vs Control %
Control	0%	83%	N/A	35%	N/A	36%	N/A	21	N/A
Sample6cs	2.5%	81%	3%	32%	8%	34%	6%	31	40%
Sample7cs	5%	80%	3%	34%	4%	35%	2%	39	80%
Sample9cs	7.5%	81%	2%	32%	9%	34%	6%	43	100%
Sample10cs	9%	80%	4%	32%	10%	34%	6%	-	-
Sample5cs	10%	81%	2%	33%	6%	35%	4%	44	100%

Table 4